AF/ZDW

920476-904613

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of	:	Leslie Derek Humphrey
Serial No.	:	09/257,223
Filed	:	February 25, 1999
For	:	Engineering Operations Channel Provision
Examiner	:	Keith M George
Art Unit	:	2663
Customer number	:	23644

CERTIFICATE UNDER 37 CRF 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service via First Class Mail in an envelope addressed to Commissioner for Patents: PO Box 1450, Alexandria, VA 22313-1450 on January 14, 2005

Minnie Wilson

APPEAL BRIEF

Honorable Director of Patents and Trademarks
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir,

This appeal is from the Examiner's final rejection of June 18, 2004. A timely Notice of Appeal (with extension of time) was mailed November 18, 2004 and received November 22, 2004.

The brief filing fee of $500 pursuant to 37 C.F.R. §41.20 is submitted herewith.

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(i) **Real Party in Interest**

This application is assigned to Northern Telecom Limited, which by change of name is now Nortel Networks Limited. The assignment is recorded at Reel/Frame: 009991/0688.

(ii) **Related Appeals and Interferences**

There are no related appeals or interferences.

(iii) **Status of Claims**

This application was filed with claims 1 through 13. During prosecution, independent claims 1, 2, 6, 7, 12 & 13 have each been amended on at least two occasions. Various of the dependent claims have also been amended and various new claims added. Currently pending in the application are claims 1, 2, 4 to 7, 12, 13 & 15 to 24. Consequently, it is the rejection of these claims that is being appealed. The claims as currently pending are set forth in the Claims Appendix.

(iv) **Status of Amendments**

A paper entitled "Response to Final Office Action Mailed June 18, 2004" was filed August 13, 2004. The amendment of this response comprised amendment of claim 4, addition of claim 24 and retention of claims 1, 2, 5, 6, 7, 12, 13 and 15 to 23. This office action comprised new grounds of rejection based on a new primary reference (Westberg US6041054) with previous grounds of rejection being withdrawn. This paper was entered.

By an Advisory Action mailed October 27, 2004, the Examiner has maintained his rejection of claims 1, 2, 4 to 7, 12, 13 and 15 to 24 on the new grounds as first presented in the Office Action of June 18, 2004. It is the continued rejection of these claims that is being appealed.

(v) **Summary of the Claimed Subject Matter**

The invention generally relates to an apparatus for providing a point to point digital subscriber line communication service over a point to point subscriber line from a line termination equipment disposed at a central station to a subscriber terminal. The invention also relates to a digital communications system, a digital subscriber network termination and

associated methods. The line termination equipment and the subscriber terminal incorporate respective first and second management systems arranged to control and supervise the digital subscriber line communication service via messaging therebetween carried in an engineering operations channel (EOC) over the line. The line termination equipment and the subscriber terminal incorporate means for providing the engineering operations channel in the form of a sequence of ATM Adaptation Layer (AAL) minicells over the line.

The use of AAL minicells for the EOC management messages is unusual because point to point link level EOC messages are usually passed down protocol levels for transmission, not upwards to higher protocol layers. This means, as mentioned at the bottom of page 2 of the application as filed, that: "currently employed EOC arrangements suffer from the disadvantage that they are protocol specific and thus lack flexibility".

According to the invention, by transmitting such subscriber line link control and management messages as AAL minicells, the EOC messages can be regarded as being passed to a higher level protocol instead. The benefit resulting from this is stated at the bottom of page 5 of the application as filed as follows: "by carrying the EOC channel in minicells, this channel is rendered wholly independent of the protocol or protocols employed for VDSL transport.".

This independence is important because VDSL and similar transport protocols for point to point links can be installed and upgraded for each subscriber separately. Hence it is vital for the carrier organisation to be able to manage many different varieties of such protocols efficiently. This can be achieved if the link management (EOC) messages at least are independent of the varieties of the link protocol in use by different subscribers by being carried in a separate engineering and operations channel (EOC) as taught by the present invention.

It follows from the above therefore that the EOC must comprise a separate channel independent of any payload channels or transport mechanisms employed for VDSL traffic between the subscriber equipment and the exchange.

(vi) **Grounds of Rejection to be Reviewed on Appeal**

The following issues are presented:

1. The rejection of claims 1 7, 12, 18, 21 & 22 under 35 U.S.C. 103(a) as being unpatentable over Westberg (US 6041054) in view of Saussy (US5936963);

2. The rejection of claims 2, 6, 13, 19 & 20 under 35 U.S.C. 103(a) being unpatentable over Westberg (US 6041054) in view of Saussy (US5936963) and further in view of Deng (US6243394);

3. The rejection of claim 16 under 35 U.S.C. 103(a) as being unpatentable over Westberg (US 6041054) in view of Saussy (US5936963) and further in view of Czerwiec et al (US6314102); and

4. The rejection of claim 17 under 35 U.S.C. 103(a) as being unpatentable over Westbergl (US 6041054) in view of Saussy (US5936963) and Czerwiec et al (US6314102) and further in view of Lamport et al (US5138615).

(vii) **Argument**

Referring to issue 1, the Examiner relies on Westberg as the primary reference for all of the grounds of rejection (issues) and thus all of the grounds of rejection can be traversed by illustrating that Westberg does not teach those elements of the present invention that the Examiner contends are taught or suggested by this reference.

Westberg teaches the use of ATM as a bearer for transporting data point to point in a network environment (column 1, lines 57 to 59). In particular, Westberg teaches the use of ATM AAL2 minicells for transporting IP/PPP (Internet Protocol/Point to Point Protocol) data packets (column 5, lines 28 to 30). A typical IP/PPP packet comprises a payload portion comprising IP data and an overhead portion comprising an IP/PPP packet data header (column 5, lines 44 to 47). Westberg concerns a process for improved bandwidth utilization and transmission efficiency of IP/PPP data packets (Abstract). This is achieved through use of a compression algorithm at a sending point to compress the IP/PPP packet data header. IP/PPP data packets with or without compressed headers are then inserted into the payloads portions of AAL2 minicells for transmission to a receiving point where a decompression algorithm re-establishes any compressed header portions of the IP/PPP data packets (column 5, line to column 6, line 3. In the particular compression process taught by Westberg and acknowledged by the Examiner, Westberg teaches a method of

compression where, if the source/destination/connection/flow information associated with the session connection/connection ID has been previously stored in a look-up table, the compression algorithm in the compressor located at the sending point need only copy the corresponding address, or a sub-portion thereof, into the CID field of the AAL2 minicell header before the AAL2 minicell is transmitted to the receiving point. At the receiving point, the decompression algorithm analyses the CID field and retrieves the source/destination/connection/flow information from the look-up table in accordance with the address stored in the AAL2 minicell header CID field.

Consequently, in the system taught by Westberg, AAL2 minicells are used to convey IP/PPP data packets comprising both payload data and header data. Thus, there is no possibility of this constituting an engineering and operations channel (EOC) as required by the present invention since there is no separation of payload and header (management and control) data nothwithstanding the fact that IP/PPP header data cannot be properly construed as comprising management and control information within the context of the present invention. The same applies equally to AAL2 minicell header data and, in particular, the CID field which merely comprises a means of reassembling AAL2 minicells and nothing more.

The suggestion that the compression algorithm can be construed as a first management system in its broadest reasonable interpretation is fanciful and does not bear serious scrutiny. A skilled person would not seriously be led by the teaching of the compressor of Westberg to arrive at a first management system as taught by the present application. The same applies to the contention that the decompression algorithm comprises a second management system. A management system comprises a system capable of controlling an entity with some degree of independence of other entities and systems. The decompression algorithm of Westberg on the other hand is merely a means for implementing the converse process of compression and is thus inescapably dependent on the compressor.

Applicant submits that Westberg is an inappropriate reference as a starting point for the rejection of claims 1, 7, 12, 18, 21 and 22 under 35 USC §103(a) for the reasons discussed above and for the following reasons. As admitted by the Examiner, Westberg

does not relate to a digital subscriber line. It will be appreciated that the present invention is specifically directed to the provision of engineering operation channels over a digital subscriber line. One skilled in art would clearly not consult as a starting point a reference which has nothing to do with digital subscriber lines and engineering operation channels. The Examiner contends that, since it is known to use ATM in DSL systems, any ATM teaching can be an appropriate starting point for a skilled person. However, there must be some motivation that would draw a skilled person to the teaching of Westberg as a starting point and the Examiner has failed to establish reasonable grounds under which a skilled person would do so.

Applicant submits that the features of Westberg cited by the Examiner in paragraph 5 simply do not correspond to the claimed features of the present invention on any interpretation. Applicant admits that Westberg teaches the use of ATM AAL2 minicells for transmission efficiency in point to point transportation of IP/PPP data packets. However, this has nothing to do with the provision of an engineering operations channel over a digital subscriber line. The Examiner argues that the CID field of an AAL2 minicell header equates to the engineering operation channel of the present invention. However, one skilled in the art would understand the term "engineering operations channel" in the present invention to mean a channel enabling a carrier to perform engineering operations (i.e. monitoring, management and control) of a subscriber terminal or link. The CID field of an AAL2 minicell header is a circuit identity which enables multiple AAL2 minicells to be associated together and to be reassembled on receipt. One skilled in the art would recognize that the CID field and an engineering operations channel are entirely separate features.

In short, one skilled in the art would consider Westberg to be a completely inappropriate reference and would not be motivated to consult it in the first place or at all.

The Examiner further combines Westberg with Saussy. However, applicant submits that even if one skilled in art were to attempt to combine these references, which applicant denies one skilled in the art would ever do, he/she would still not arrive at the claimed invention. Combining Westberg and Saussy, one skilled in the art would arrive at an efficient mechanism for transport of IP packets using AAL2 minicells and, in preferred embodiments, mapping of IP and PPP fields to the CID field of AAL2 minicells over an ADSL point to point

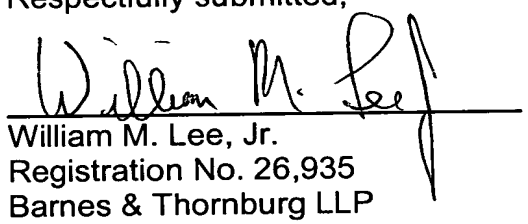
link. Thus, one skilled in the art would arrive at a more efficient mechanism for transport of user data over the ADSL link. This has nothing to do with the present invention which is concerned with the provision of an engineering operations channel (i.e. a carrier monitoring, management and control channel and not a bearer channel for transporting user data), namely a channel independent of payload traffic channels or mechanisms.

The rejections of other claims under issues 2 to 4 are moot in view of the foregoing.

It is respectfully submitted therefore that the continued rejection of claims 1, 2, 4 to 7, 12, 13 & 15 to 24 as addressed above cannot be justified and that these claims define a novel and patentable invention in view of the prior art of record. Reversal of the Examiner and allowance of the claims is therefore requested.

January 14, 2005

Respectfully submitted,



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CLAIMS APPENDIX

1. Apparatus for providing a point to point digital subscriber line communication service over a point to point subscriber line from a line termination equipment disposed at a central station to a subscriber terminal, wherein the line termination equipment and the subscriber terminal incorporate respective first and second management systems arranged to control and supervise said digital subscriber line communication service via messaging therebetween carried in an engineering operations channel over the line, and wherein the line termination equipment and the subscriber terminal incorporate means for providing said engineering operations channel in the form of a sequence of ATM Adaptation Layer (AAL) minicells over the line.

2. A digital communications system comprising: a subscriber network termination, a line termination equipment, and a point to point transmission path therebetween, the subscriber termination and the line termination being coupled to the path via respective first and second modems, wherein the subscriber termination and the line termination each incorporate respectively a first and second management system each system consisting of a corresponding plurality of management levels, said first and second management systems being arranged to control and supervise a digital subscriber line communication service via messaging carried in an engineering operations channel over the line, wherein said subscriber termination and the line termination each incorporate respective multiplexer means interfacing with the management levels of that termination, and wherein said subscriber termination and line termination incorporate respective packet transaction means each interfacing with the respective multiplexer means for carrying messaging between corresponding subscriber termination and line termination management levels in an engineering operations channel over the path, said engineering operations channel being comprised by a sequence of ATM Adaptation Layer (AAL) minicells over the path.

4. A digital communications system as claimed in claim 24, wherein said line termination equipment is coupled to an ATM backplane whereby the digital service is delivered.

5. A digital communications system as claimed in claim 4, wherein said line comprises a twisted conductor pair.

6. A digital subscriber network termination for receiving a point to point digital subscriber line service over a point to point subscriber line coupled thereto, the subscriber termination including a management system consisting of a plurality of management levels, said management system being arranged to control and supervise said digital subscriber line communication service via messaging carried in an engineering operations channel over the line, multiplexer means interfacing with the management levels of the subscriber termination, and packet transaction means interfacing with the multiplexer means for carrying messaging to and from the management levels in an engineering operations channel over the line, said engineering operations channel being comprised by a sequence of ATM Adaptation Layer (AAL) minicells over the line.

7. A method of providing a digital subscriber line communication service over a digital subscriber link over a point to point line from a line termination equipment disposed at a central station to a subscriber terminal, the method comprising providing a engineering operations channel for effecting control and management of the subscriber terminal, and transporting said engineering operations channel in a sequence of ATM Adaptation Layer (AAL) minicells over the line.

12. A method of transporting digital subscriber line traffic over a digital subscriber link over a point to point line from a central station to a subscriber terminal, the method comprising providing an engineering operations channel over the line, wherein said engineering operations channel is transported over said line in ATM Adaptation Layer (AAL) minicells.

13. A method of controlling a point to point digital subscriber line communications system comprising a subscriber network termination, a line termination equipment, and a point to point transmission path therebetween, the subscriber termination and the line termination each incorporating respectively a first and second management system each system consisting of a corresponding plurality of management levels, said first and second management systems being arranged to control and supervise said digital subscriber line

communication service, the method comprising providing messaging paths between corresponding management levels, and multiplexing said messaging paths into an engineering operations channel over the line, wherein said engineering operations channel is transported in a sequence of ATM Adaptation Layer (AAL) minicells over the line.

15. A method as claimed in claim 7, wherein packet voice traffic is carried in spare capacity in said engineering operations channel.

16. A method as claimed in claim 15, wherein the engineering operations channel is framed and byte oriented.

17. A method as claimed in claim 16, wherein the engineering operations channel is scrambled over the line.

18. A method as claimed in claim 17, wherein synchronisation between the central station and the subscriber terminal is performed during a period of transmission of null data on said engineering operations channel.

19. An apparatus as claimed in claim 1, wherein the AAL minicells are AAL2 minicells.

20. A digital communications system as claimed in claim 2, wherein the AAL minicells are AAL2 minicells.

21. A digital subscriber network termination as claimed in claim 6, wherein the AAL minicells are AAL2 minicells.

22. A method as claimed in claim 7, wherein the AAL minicells are AAL2 minicells.

23. A method as claimed in claim 12, wherein the AAL minicells are AAL2 minicells.

24. A digital communication system as claimed in claim 2, wherein said subscriber termination and line termination each incorporate scrambling and descrambling means.